REMARKS

Claims 1-11 are pending in the present application and stand rejected on a variety of grounds. Claim 1 has been amended herein to verify that in each cycle the part is exposed to hydrogen atoms, while Claim 8 has been amended to clarify that in each cycle the part is exposed to oxygen atoms. These amendments are fully supported by the specification as filed, for example, in Figure 2 and at page 11, lines 3-15.

Applicant notes that at one point during prosecution, Claims 1-7 were withdrawn. However, in the previous Office Action and in the current Office Action all of the claims have been examined. Thus, Applicant believes that all of the claims are currently pending.

Claims Rejections Under 35 U.S.C. § 112

Claims 1-11 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner found that the specification only teaches to "evacuate" the chamber between reactants and fails to provide support for "removing" gases by any means. The rejection apparently stems from the finding that the term "evacuating" has been construed by the Federal Circuit to have a particular meaning that is different from "removing." However, the present issue is one of written description support, not one of claim interpretation. In this regard, Applicant submits that the skilled artisan would understand from the specification as a whole that the invention is not limited to any particular removal method. In fact, in a previous Office Action the Examiner himself found that in the context of this invention "evacuate" should be considered to mean "to empty or remove the contents." Office Action of December 13, 2005, second page, emphasis in original. In addition, the Examiner initially allowed Claims 9-11, which depend from Claim 8 which recites "removing gases from the chamber." Thus, the Examiner clearly understood that the specification teaches the broad concept of "removing" gases from the chamber. The fact that "evacuating" has been construed to have a particular meaning in the claims by the Federal Circuit does not change the teaching of the specification and does not mean that the specification fails to provide adequate written description support for "removing."

Further, contrary to the Examiner's assertion that only "evacuating" is taught, the specification describes more than one way of removing reactant gas from the reaction space. For

example, in the background section of the specification, the general features of sequential chemical vapor deposition are described and it is taught that in one embodiment "excess of each [reactant] gas is *removed* by flowing a purge gas through the reactor between each exposure cycle." (paragraph [0006] of the application as published, emphasis added). Using a vacuum pump is described as an alternative method for removing reactants in paragraph [0007]. Paragraphs [0037] and [0038] discuss the advantages of using a purge gas and using a vacuum pump to remove excess reactants in different situations. Thus, Applicant submits that it is clear that the specification is concerned with the removal of reactants, and not simply with evacuating the chamber of reactants with the aid of a vacuum pump. The Examiner's contention that the specification only teaches to evacuate the chamber between reactants is simply not accurate and to limit the claims to the use of the term "evacuating" would not only ignore the clear written description support for the more general concept of "removing" excess reactants, but would also unfairly limit the applicant to a single preferred embodiment.

Applicant also notes that in several related applications the Patent Office implicitly found written description support *in the identical disclosure* for "removing" reactant gas between reactant pulses. U.S. Patent No. 6,652,924, of which the present application is a divisional, recites "removing gases from the chamber" in both independent Claims 1 and 15 and recites "removing excess first reactant gases from the chamber" and "removing excess second reactant gases from the chamber" in Claim 13. Similarly, U.S. Patent No. 6,616,986, which is a continuation of U.S. Patent No. 6,342,277, to which the present application claims priority, recites "removing the gaseous first reactant from the chamber" in Claim 1 and "removing substantially all of the gaseous first reactant from the chamber" in Claim 12. The Patent and Trademark Office has a duty to apply consistent standards in examining patent applications. *C.f. In re Cortwright*, 165 F.3d 1353, 49 U.S.P.Q.2d 1464, 1467 (Fed. Cir. 1999).

In view of the arguments presented above, Applicant submits that the rejection of Claims 1-11 for lack of written description support for the term "removing" should be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sandaresan (U.S. Patent No. 6,064,077) in view of Bedair (Atomic Layer Epitaxy Deposition

Processes). Sandaresan teaches a method of forming silicon dioxide in which multiple monolayers of silicon are deposited and then subsequently oxidized. Bedair was found to teach an ALD process in which monolayers of silicon are deposited using atomic hydrogen in a layer-by-layer fashion. The Examiner concluded that it would have been obvious at the time of the invention to use the method taught by Bedair to deposit silicon in a process taught by Sandaresan. The asserted combination of Sandaresan and Bedair would suggest depositing multiple silicon layers by ALD, as taught in Bedair, and subsequently oxidizing the multiple deposited silicon layers to form a silicon oxide layer, as taught in Sandaresan.

Claim 1 has been amended to clarify that the deposited silicon is exposed to oxygen *in each deposition cycle*. This is different from the teaching in Sandaresan in which multiple monolayers of silicon are deposited and subsequently converted to silicon dioxide. Thus, in view of the current clarification of Claim 1, Applicant submits that the rejection should be withdrawn.

In addition, Claims 8-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bedair in view of Morishita (New Substances for Atomic Layer of Silicon Oxide). Again, the Examiner found that Bedair teaches an ALD process using hydrogen radicals as a reducing agent. Morishita was found to teach ALD processes for depositing silicon dioxide using silicon precursors that comprise oxygen. However, Bedair has no teaching or suggestion of depositing silicon oxide in any manner and neither reference teaches or suggests using atomic oxygen as recited in Claim 8.

Furthermore, Bedair teaches use of hydrogen radicals only for epitaxial deposition of semiconductor materials. As will be appreciated by skilled artisans, this context has particular needs in order to achieve crystal alignment and thermal limitations. There is no indication in the art, prior to the present invention, that the skilled artisan would have been motivated to apply the teachings of Bedair outside the semiconductor epitaxy environment. In particular, Bedair teaches that hydrogen radicals could reduce deposition temperatures from 815-890°C down to about 600°C for his processes. See Bedair at page 183. As Morishita's process is already conducted well below 815-890°C, in fact at room temperature, the skilled artisan had no motivation to further lower temperatures by use of Bedair's process. See Morishita at page 68.

In view of the lack of teaching or suggestion of depositing silicon oxide or using atomic oxygen, as well as the lack of motivation for the combination of Bedair and Morishita, Applicant

submits that a prima facie case of obviousness has not been established and requests withdrawal of this rejection.

CONCLUSION

In view of the amendments and remarks presented above, Applicant submits that the present application is in condition for allowance and respectfully requests the same. If any issues remain, the Examiner is cordially invited to contact Applicant's representative at the number provided below in order to resolve such issues promptly.

Respectfully submitted,

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